

-continued

Samples Milled <sup>(1)</sup>	Viscosity (1 day) (in centipoises)
C.C./olive oil/ stearic acid 25% 74% 1%	$20 \times 10^3$
C.C./olive oil/ oleic acid 25% 74% 1%	$26.5 \times 10^3$
C.C./olive oil/zein 25% 70% 5%	$19.4 \times 10^3$
C.C./olive oil/ Fibersol II <sup>(4)</sup> 19% 58% 23%	$320 \times 10^3$
C.C./olive oil/ Micropore Buds 515 <sup>(5)</sup> 29% 58% 28%	$36 \times 10^3$

<sup>(1)</sup>The abbreviation, C.C., denotes calcium citrate prepared in accordance with Example 1.

<sup>(2)</sup>The calcium citrate was coated with sodium stearate at a level of 2%.

<sup>(3)</sup>The spray-dried calcium citrate (18.9 parts) was coated with gum arabic (2 parts) and orange juice (2 parts), and the coated calcium citrate was used at a level of 15% with the oil at 85%. This sample was not milled.

<sup>(4)</sup>Fibersol II: A modified dextrin (Matsutani Chemical Industries, Hyogo-kon, Japan).

<sup>(5)</sup>Micropore Buds 515: A maltodextrin produced by A.E. Staley Manufacturing Company, Decatur, IL).

### EXAMPLE 9

#### Calcium Citrate Hardened Oil Replacement For Roll-In Margarine In Baked Goods

348 g of micromilled calcium citrate in olive oil (32% salt) was spread over a Sweet Danish dough (1500 g) and rolled in. Sample was then retorted for 30 minutes, flattened, and rolled. This procedure was repeated three times in order to form multiple layers. The viscosity of the calcium citrate/olive oil sample was high enough (close to roll-in margarine) that there was no squeezing of oil out of the dough.

The dough was then made into Swiss Rolls, proofed for 45 minutes, and then baked for 20 minutes. After baking and allowing to cool to room temperature, the Swiss rolls that resulted were stored in boxes at room temperature. Samples were compared to control made with margarine the second day. There was no discernible difference found between the margarine control and that made with calcium citrate/oil in appearance, layer formation, and taste.

This example shows that calcium citrate hardened non hydrogenated oils can be used to replace margarine, a hydrogenated oil that is highly saturated with trans fatty acids. In addition, these samples provide about 30% less fat since equal weight of margarine and the salt/oil dispersions were used to produce the Sweet Danish.

What is claimed is:

1. A vegetable oil based composition comprising from about 0.5% to about 35% by weight of a finely divided calcium citrate salt, said salt being a reaction product of a calcium compound selected from the group consisting of calcium hydroxide, calcium oxide and calcium carbonate with citric acid wherein said reaction product has a mole ratio of calcium to citric acid from 2.5:2 to 2.95:2 and a pH value in a 1% water slurry of said reaction product from about 4 to below 7 at 25° C.

2. A composition according to claim 1 wherein said reaction product has a mole ratio of calcium to citric acid from about 2.61:2 to about 2.92:2.

3. A composition according to claim 1 wherein a 1% water slurry of said salt shows a pH value of from about 4 to about 7.

4. A composition according to claim 1 wherein a 1% water slurry of said salt shows a pH value of from 4 to about 5.5.

5. A composition according to claim 1 wherein the amount of said salt is from about 15% to about 20% by weight of the composition.

6. A composition according to claim 1 wherein said calcium citrate salt particles are coated with a food-acceptable additive.

7. A vegetable oil-based composition comprising from about 0.5% to about 35% by weight of a finely divided calcium citrate salt, said salt being a reaction product of a calcium compound selected from the group consisting of calcium hydroxide, calcium oxide and calcium carbonate with citric acid wherein said reaction product has a mole ratio of calcium to citric acid from 2.5:2 to 2.95:2 and a pH value in a 1% water slurry of said reaction product from about 4 to below 7 at 25° C. and said salt being in the form of small platelets of a length of below 3 microns, a width of below about 2 microns and a thickness of below about 1 micron.

8. A composition according to claim 7 wherein the average length of the crystals is about 1.5 microns, average width is about 1 micron and the average thickness is from about 0.1 to about 0.2 micron.

9. A composition according to claim 7 wherein said reaction product has a mole ratio of calcium to citric acid from about 2.61:2 to about 2.92:2.

10. A composition according to claim 7 wherein a 1% water slurry of said salt shows a pH value of from about 4.0 to about 7.

11. A composition according to claim 7 wherein a 1% water slurry of said salt shows a pH value of from about 4.0 to about 5.5.

12. A composition according to claim 7 wherein the amount of said salt is from about 15% to about 20% by weight of the composition.

13. A composition according to claim 7 wherein said calcium citrate salt particles are coated with a food-acceptable additive.

14. A vegetable oil based food composition comprising from about 0.5% to about 5% by weight of a finely divided calcium citrate salt, said salt being a reaction product of a calcium compound selected from the group consisting of calcium hydroxide, calcium oxide and calcium carbonate with citric acid wherein said reaction product has a mole ratio of calcium to citric acid from 2.5:2 to 2.95:2 and a pH value in a 1% water slurry of said reaction product from about 4 to below 7 at 25° C.

15. A composition according to claim 14 wherein said reaction product has a mole ratio of calcium to citric acid from about 2.61:2 to about 2.92:2.

16. A composition according to claim 14 wherein a 1% water slurry of said salt shows a pH value of from about 4.0 to about 7.

17. A composition according to claim 14 wherein a 1% water slurry of said salt shows a pH value of from about 4.0 to about 5.5.

18. A composition according to claim 14 wherein said calcium citrate salt particles are coated with a food-acceptable additive.

19. A vegetable oil-based food composition comprising from about 0.5% to about 5% by weight of a finely divided calcium citrate salt, said salt being a reaction